

**Amendment to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended) A method of fabricating a graded index plastics material optical fiber whose refractive index varies between its center and its periphery, said method comprising the following process steps:

preparing at least two liquid compositions with different refractive indices, each composition having at least one polymer, a substance adapted to vary the refractive index being present in at least one of said compositions, and a cross-linking starter being present in at least one of said compositions;

filling a preform formation system with said compositions;

producing a liquid preform in said preform formation system, the refractive index of said liquid preform having a given gradient, wherein said gradient is formed within said preform formation system with substantially no flow along said system; and

after said liquid preform exits said preform formation system with a viscosity from 1 to 5 Pa.s., spinning said liquid perform outside said perform formation system to obtain a graded index plastics material optical fiber.

2. (currently amended) The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein said step of forming said liquid preform having a gradient within said preform formation system, further includes the step of obtaining a diameter of the liquid preform compatible with said spinning drawing.

3. (currently amended) The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein the production within said preform formation system of said liquid preform having a gradient, is followed by a step of obtaining a radial dimension of said liquid preform compatible with said spinning drawing.

4. (previously presented) The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein said filling step is such that said compositions are separated in said preform formation system and the production of a discontinuously graded index (stepped index) preform includes bringing said compositions into contact.

5. (previously presented) The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein the production of a continuously graded index preform includes changing the distribution between the center and the periphery of said preform of at least one of the constituents of at least one of said compositions by mechanical treatment.

6. (previously presented) The method claimed in claim 1, of fabricating a graded index plastics material optical fiber, wherein spinning is preceded by controlled pressurization of said preform formation system either by injecting a compressed neutral gas into said system or by actuating a piston in said system.
7. (original) A preform formation system for implementing a method as claimed in claim 1, of fabricating a graded index plastics material optical fiber, said system containing a first area for isolating said compositions during said filling and a second area for formation of said graded index preform, in which system said first area and said second area have at least one common portion.
8. (original) The preform formation system claimed in claim 7, comprising as many concentric enclosures of given axis and given internal dimensions as there are compositions to be injected, the external enclosure being extended axially by a member with varying internal dimensions and the internal enclosure(s) being removable and longer than said external enclosure.
9. (original) The preform formation system claimed in claim 7, comprising means for applying mechanical treatment to said compositions chosen from vibration means and rotation means.
10. (original) The preform formation claimed in claim 9, wherein said vibration means comprise an ultrasound transducer connected to a probe.

11. (currently amended) The preform formation system claimed in claim 7, comprising as many concentric enclosures with a given axis and given internal dimensions as there are compositions to be injected, the external enclosure being extended axially by a member with varying internal dimensions and the internal enclosure(s) being removable and longer than said external enclosure, and a spinning member which receives axially said member with varying internal dimensions and contains a removable closure member.
12. (previously presented) The method claimed in claim 5, of fabricating a graded index plastics material optical fiber, wherein the mechanical treatment is one of rotation and vibration.
13. (new) A method of fabricating a graded index plastics material optical fiber whose refractive index varies between its center and its periphery, said method comprising the following process steps:
  - preparing at least two liquid compositions with different refractive indices, each composition having at least one polymer, a substance adapted to vary the refractive index being present in at least one of said compositions, and a cross-linking starter being present in at least one of said compositions;
  - filling a preform formation system with said compositions;
  - isolating said compositions in a first area of said preform formation system during said filling;

producing a liquid preform in a second area of said preform formation system, the refractive index of said liquid preform having a given gradient, wherein said gradient is formed within said preform formation system with substantially no flow along said system and

wherein said first area and said second area of said preform formation system have at least one common portion and as many concentric enclosures of a given axis and given internal dimension as there are compositions injected into said preform formation system, and

wherein an external enclosure of said preform formation system is extended axially by a member with varying internal dimensions and wherein one or more internal enclosures of said preform formation system are removable and longer than said external enclosure; and

after said liquid preform exits said preform formation system, spinning said liquid preform outside said preform formation system to obtain a graded index plastics material optical fiber.